

CLAIMS

What is Claimed is:

1. ~~An automatic hot food vending machine, comprising in combination:~~
hopper means for holding an inventory of uniformly sized, individual
refrigerated or frozen portions of said food and for maintaining said inventory in a
refrigerated or frozen condition;
dispenser means for selectively dispensing one of said portions from said
inventory by gravity;
oven means for receiving said one portion from said dispenser means, for
heating said portion by irradiation thereof with microwave energy for a
predetermined length of time, and for discharging said heated one portion from said
apparatus thereafter by gravity;
changer means for receiving, counting, authenticating, and storing money
inserted into said machine, and for refunding counterfeit money inserted therein or
genuine money upon command; and
control and monitor means for:
receiving a signal from said changer means that a predetermined
amount of said authenticated money has been inserted into said machine;
actuating said dispenser means upon receipt of said signal to dispense
said one portion into said oven means; and
activating said oven means to receive, heat, and discharge said portion
from said machine.

2. ~~The machine of claim 1, wherein said dispenser means further
comprise:~~

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3 ~~said hopper means including a lower, inverted frusto-pyramidal chamber~~
4 having a flat bottom with a generally semicircular opening therethrough guarded by
5 a quadrant-shaped closure and defining an inwardly flanged lip about said opening,
6 said opening having a diameter at least twice a largest dimension of one of said
7 portions;

8 an upright conical member having a largest diameter about equal to that of
9 said semicircular opening, said member being positioned generally centered within
10 said chamber above and spaced apart from said opening;

11 a cylindrical pan having a diameter coextensive with said opening, an open
12 top in communicating engagement with said opening, a depth below said opening,
13 and a generally flat bottom having a quadrant shaped aperture therein in vertical
14 alignment with said quadrant-shaped closure defining a dispenser opening;

15 a shaft rotatably-mounted coaxially within said semicircular opening and
16 extending from above said opening, through said pan, to below said bottom of said
17 pan;

18 a quartet of elongated rollers extending radially outward from said shaft in
19 even distribution within a common plane normal to said shaft and rotatably journaled
20 thereon for rolling movement of an outer portion of each said rollers upon an upper
21 surface of said flanged lip above said semicircular opening;

22 a paddle wheel having four paddles, each said paddle extending radially
23 outward from said shaft in alignment with one of said rollers and having a width and
24 radial extent sufficient to sweep substantially all of a quartic volume defined within
25 said pan between adjacent said paddles into alignment with said dispenser opening
26 upon successive 90° incremental rotations of said shaft; and

27 means for selectively rotating said shaft through said successive 90°
28 incremental rotations when actuated.

1 ²/₃. The machine of claim ¹/₂, wherein said dispenser means further
2 comprise:

3 means for detecting each said successive 90° incremental rotation of said
4 shaft and for deactivating said dispenser means upon detection thereof.

1 ³/₄. The machine of claim ¹/₂, wherein said dispenser means further
2 comprise:

3 means for detecting whether or not said portion of food has been dispensed
4 from said dispenser means after one of said 90° incremental rotations, for advising
5 said control and monitor means thereof, and for reactivating said dispenser means if
6 not.

1 ⁴/₅. The machine of claim ³/₄, further comprising:
2 means for detecting whether or not said portion of food has been dispensed
3 from said dispenser means after a predetermined number of said successive 90°
4 incremental rotations of said shaft, and for refunding an amount of said money from
5 said changer means if not.

1 ⁵/₆. The machine of claim ⁴/₅, further comprising:
2 means for notifying a remote location that said portion of said food has not
3 been dispensed from said dispenser means after a predetermined number of said
4 successive 90° incremental rotations of said shaft.

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1 7. ~~The machine of claim 1, wherein said oven means further comprises~~
2 an enclosure below said dispenser means, shielded against passage of
3 microwave energy;
4 means for receiving said one portion into said shielded enclosure;
5 means for radiating microwave energy into said enclosure for a
6 predetermined length of time to heat said one portion; and
7 means for discharging said heated one portion from said enclosure and out of
8 said ^{machine} ~~apparatus~~ by gravity.

1 8. The machine of claim 7, wherein said means for receiving said one
2 portion into said enclosure further comprise:
3 said enclosure having at least one upward-facing opening therein and
4 positioned below said dispenser means to receive said one portion;
5 a shielded door on said enclosure movable between closed and open
6 positions; and
7 means for selectively opening and closing said door when activated.

1 9. The machine of claim 8, wherein said means for discharging said
2 heated one portion from said enclosure and out of said ^{machine} ~~apparatus~~ further comprise:
3 [said enclosure being mounted for tilting movement about a horizontal axis to
4 a position wherein said enclosure opening faces generally downward to discharge
5 said one portion from said enclosure by gravity;
6 means for selectively tilting said enclosure about said horizontal axis to said
7 position; and]
8 means for catching and conveying said heated one portion from said
9 enclosure to an exterior opening in said machine..

1 ~~10. The machine of claim 9, further comprising: means for detecting~~
2 ~~whether or not said one heated portion has been discharged from said enclosure~~
3 ~~and for refunding an amount of said money from said changer means if not.~~

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1 11. The machine of claim 10 further comprising: means for notifying a
2 remote location that said one heated portion has not been discharged from said
3 enclosure.

1 ⁶~~12.~~ The machine of claim ¹~~2~~, wherein said oven means further comprises:
2 an enclosure shielded against passage of microwave energy therefrom, said
3 enclosure having a face with an opening therethrough, said opening being guarded
4 by a shielded door hingeably-attached to said enclosure over said face for
5 movement between opened and closed positions, said enclosure being
6 rotatably-journaled about a horizontal axis for rotation between an upward facing
7 position below said dispenser means opening, a horizontally-facing cooking
8 position, and a downward facing discharge position;
9 means for opening said door and for rotating said enclosure to said
10 upward-facing position to receive said one portion from said dispenser means;
11 means for rotating said enclosure to said horizontally-facing position and for
12 closing said door; means for radiating microwave energy into said closed enclosure
13 for said predetermined length of time to heat said one portion;
14 means for opening said door and for rotating said enclosure to said
15 downward-facing position to discharge said heated one portion therefrom by gravity;
16 and

17 means for catching and conveying said one heated portion from said
18 enclosure to an exterior opening in said machine by gravity.

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1 ⁷~~13~~. The machine of claim ⁶~~12~~, wherein: said dispenser means further
2 comprises a chute adapted to catch and convey said one portion from said
3 dispenser means opening to said enclosure opening; and
4 said means for catching and conveying said one heated portion from said
5 enclosure to said exterior opening in said machine further comprises: a chute
6 adapted therefor.

1 ⁸~~14~~. The machine of claim ⁶~~12~~, further comprising:
2 means for detecting each said successive 90° incremental rotation of said
3 shaft and for deactuating said dispenser means upon a detection thereof;
4 means for detecting whether or not said portion of said food has been
5 dispensed from said dispenser means after one of said 90° incremental rotations of
6 said shaft, for advising said control and monitor means thereof, and for reactuating
7 said dispenser means if not;
8 means for detecting whether or not said portion of food has been dispensed
9 from said dispenser means after a predetermined number of said successive 90°
10 incremental rotations of said shaft and for refunding an amount of said money from
11 said changer means if not; and
12 means for detecting whether or not said one heated portion has been
13 discharged from said machine and for refunding an amount of said money from said
14 changer means if not.

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1 ⁹15. The machine of claim ⁸14, further comprising:
2 means for notifying a remote location that said portion of said food has not
3 been dispensed from said dispenser means after a predetermined number of said
4 successive 90° incremental rotations of said shaft; and
5 means for notifying a remote location that said one heated portion has not
6 been discharged from said machine.

1 ~~16. The machine of claim 1, wherein said changer means further~~
2 comprises means for:
3 receiving a dollar bill into said machine;
4 comparing said bill electro-optically to an exemplar of predetermined
5 authenticity and amount;
6 rejecting said bill from said apparatus if said bill is not authentic or correct in
7 amount;
8 stacking said bill within said apparatus and generated said signal to said
9 control and monitor means if said bill is authentic and correct in amount;
10 holding a stock of ordered coin within said apparatus; and
11 ejecting a predetermined amount of said coin selectively from said apparatus
12 upon command from said control and monitor means.

1 17. The machine of claim 16, further comprising:
2 means for monitoring the number of said bills and coin in said apparatus; and
3 ~~means for notifying a remote location of said number and amount.~~

1 ~~18. An automatic hot food vending machine, comprising in combination:~~
2 hopper means for cold storage of an inventory of uniformly-sized, refrigerated
3 or frozen portions of said food;
4 dispenser means for selectively dispensing one of said portions from said
5 inventory;
6 oven means for receiving said one portion from said dispenser means, for
7 heating said portion by irradiation thereof with microwave energy for a
8 predetermined length of time, and for discharging said heated one portion from said
9 apparatus thereafter;
10 changer means for receiving, counting, and storing money inserted into said
11 machine; and
12 control and monitor means for:
13 receiving a signal from said changer means that a predetermined
14 amount of said money has been inserted into said machine;
15 actuating said dispenser means upon receipt of said signal to dispense
16 said one portion into said oven means; and
17 activating said oven means to receive, heat, and discharge said portion
18 from said machine.